REMARKS

Claims 1, 60-73 and 79-91 and 97-101 are pending in the application. Claims 1 and 73 have been amended to remove the limitation that the array does not define a diffraction grating.

Applicants have amended to the claims to put them in better form for appeal. Applicants submit that the claims in their present form have been fully examined and raise no new issues. Specifically the present claims were presented in the Amendment filed on April 6, 2005 ("the April 6, Amendment"). Because the claims in their present form have been presented previously and present no new issues, Applicants request that they be entered.

New Rejections

Claims 1, 60-77, 79-91 and 99-101 were rejected under 35 USC §112 as failing to comply with the written description requirement. Applicants submit that the written description requirements have been met. However, to put the claims in better form for appeal, Applicants have deleted the limitation that the array does not define a diffraction grating, obviating the current rejections.

Rejections under §103

The present claims were rejected under 35 USC §103 in the May 3, 2005 Office Action. Specifically, claims 1, 60, 61, 63-66, 73, 79, 80, 82-85, 97 and 98 were rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent No. 5,478,527 to Gustafson et al. ("Gustafson") in view of US Patent No. 5,478,527 to Chenchik et al. ("Chenchik"). Claims 62 and 81 were rejected under 35 U.S.C. §103(a) as being unpatentable over Gustafson and Chenchik and further in view of US Patent No. 6,329,209 to Wagner et al. ("Wagner"). Claims 67-72 and 86-91 were again rejected under 35 U.S.C. §103(a) as being unpatentable over Gustafson and Chenchik and further in view of US Patent No. 5,482,867 to Barrett et al. ("Barrett").

Applicants here reassert the distinction between the array and associated assay technique of the primary reference, Gustafson, and that of the presently claimed invention, and the relevance of these distinctions to the patentability of the pending claims.

The pending claims are directed to particular arrays of protein-binding agents stably attached to the surface of a solid support, and kits incorporating such arrays. The arrays and kits are used for conducting proteomic analyses such as differential binding assays in which the binding of a particular protein, that has been labeled with a fluorescent dye, to an array element is detected by a fluorescence-based detection system (see, e.g., page 28, line 3 to page 30, line 13 and page 33, line 32 to page 34, line 7). The arrays are designed to optimize the effectiveness of this fluorescence-based detection system.

The claims have previously been focused on a particular embodiment of the invention in hopes of expediting prosecution. These claims recite an embodiment of the invention wherein an aluminum on glass substrate surface is coated with a particular configuration of silicon dioxide on the aluminum substrate surface that can amplify the fluorescent signal used to read the arrays with resultant improvement in performance of the arrays in practice. In particular, a suitable configuration is a thickness of between about 200 and 900Å, and a preferred fluorescent signal generating dye set, the amine reactive dyes Cy3 and Cy5. Claims 1 and 73 recite that the solid substrate has a substantially planar surface comprising a layer of aluminum formed on a glass base material, the aluminum coated with a silicon dioxide coating having a thickness of between about 200 and 900Å. Dependent claims 97-98 and 99-101 and, depending from claims 1 and 73 respectively, recite the presence fluorescent dye reagents or labeled proteins, and the nature and identity of the preferred fluorescent dyes.

Gustafson is specifically addressed to providing a suitable substrate for its reflective diffraction biograting. In various embodiments, Gustafson describes substrates composed of silicon applied over silicon dioxide (e.g., see Fig. 4) and in which silicon dioxide is applied over a reflective metal deposited on silicon. The objective is to provide an optically flat reflective substrate that apparently enhances reflective diffraction from a biograting formed on the substrate. As described in Gustafson, diffraction gratings work by causing incident light to be diffracted into specific angles as opposed to being scattered in all directions. In particular, diffraction biogratings are formed by parallel linear zones of an active and deactivated binding reagent. The zones form a diffraction grating when the active reagent binds with its opposite member of its binding pair. (col. 1, lines 25-35 and 44-49).

Thus, the Gustafson assay works by contacting the diffraction grating with a sample analyte and illuminating the surface and measuring light at the light detected at the light diffraction angles. If the analyte binds to the active reagent, a diffraction grating is formed. Light detected at the diffraction angles correlates to the quantity of the analyte (col. 1, lines 63-67).

The Examiner has contended throughout prosecution that Gustafson relates to labeled assays. Specifically, the Examiner contends the following section of Gustafson shows that the reference relates to signal amplification of a fluorescently labeled probe:

> "The term "diffraction grating", as used herein, is defined to include gratings which are formed in one or more immunological steps. For the method of this invention, the diffraction grating is formed directly by the conjugation of the non-light disturbing binding reagent on the insoluble surface with a light disturbing analyte." (col. 4, lines 41-46).

Applicants fail to see how this applies to fluorescently-labeled probes. While it may be possible to use a fluorescently-labeled analyte in the diffraction gratings of Gustafson, there would be no point in doing so. In the context of the Gustafson, a fluorescently labeled analyte is no more or less "light disturbing" than a label-free analyte; the assays work by measuring the diffraction of incident light on a diffraction grating created by the binding of the analyte. Whether sections of that diffraction grating are fluorescing is wholly inapposite to the operation of the assays of Gustafson.

This distinction is important because, as explained in prior Responses and as noted by Dr. Charych in the Declaration filed on April 6, 2005, a person skilled in the art would not have seen any advantage in combining the teachings of Gustafson and any of the other references to which the Examiner has referred, namely Chenchik, Wagner and Barrett since Gustafson's teaching of the use of a flat substrate of silicon dioxide on reflective metal would have been viewed as specific to their particular label-free assay.

In addition, various dependent claims provide a further and independent basis for patentability. For example, claim 73 recites fluorescent protein label reagents as party of the kit and claim 97 recites the array of claim 1 with bound fluorescently labeled proteins. Claims 98-101 recite the nature and identity of suitable fluorescent labels. These additional claim elements further distinguish the pending claims from Gustafson alone or in combination with other references.

Conclusion

Applicants submit that the issues raised in the Final Office Action have been addressed and respectfully request entry of these amendments to put the pending claims in form for appeal. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at (510) 663-1100. If any additional fees are due in connection with the filing of this amendment, the Commissioner is authorized to charge such fees to Deposit Account 500388 (Order No. CHIRP014).

Respectfully submitted,
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